

- !** **Important:** Click on the different icons for:
- ?** Help to analyze the results in the Quality Report
  - i** Additional information about the sections

**💡** Click [here](#) for additional tips to analyze the Quality Report

## Summary



Project	Island_Abris_ALL
Processed	2017-05-24 11:42:34
Camera Model Name(s)	albris_8.0_7152x5368 (RGB)
Average Ground Sampling Distance (GSD)	0.96 cm / 0.37 in

## Quality Check



<b>?</b> Images	median of 35000 keypoints per image	✓
<b>?</b> Dataset	200 out of 200 images calibrated (100%), 11 images disabled	✓
<b>?</b> Camera Optimization	0.13% relative difference between initial and optimized internal camera parameters	✓
<b>?</b> Matching	median of 8333.29 matches per calibrated image	✓
<b>?</b> Georeferencing	yes, 5 GCPs (5 3D), mean RMS error = 0.006 m	✓

## Calibration Details



Number of Calibrated Images	200 out of 211
Number of Geolocated Images	211 out of 211

## **?** Initial Image Positions

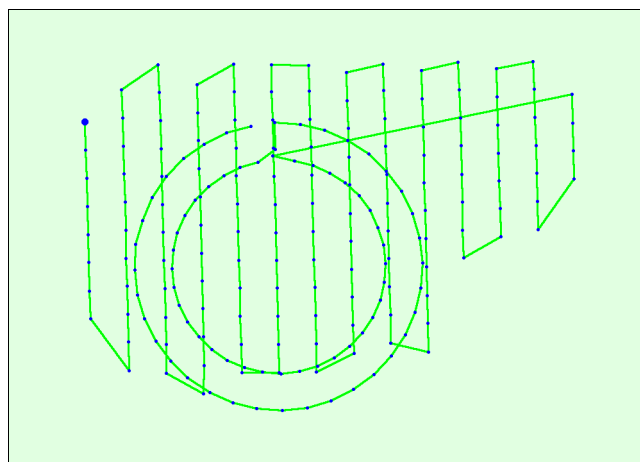
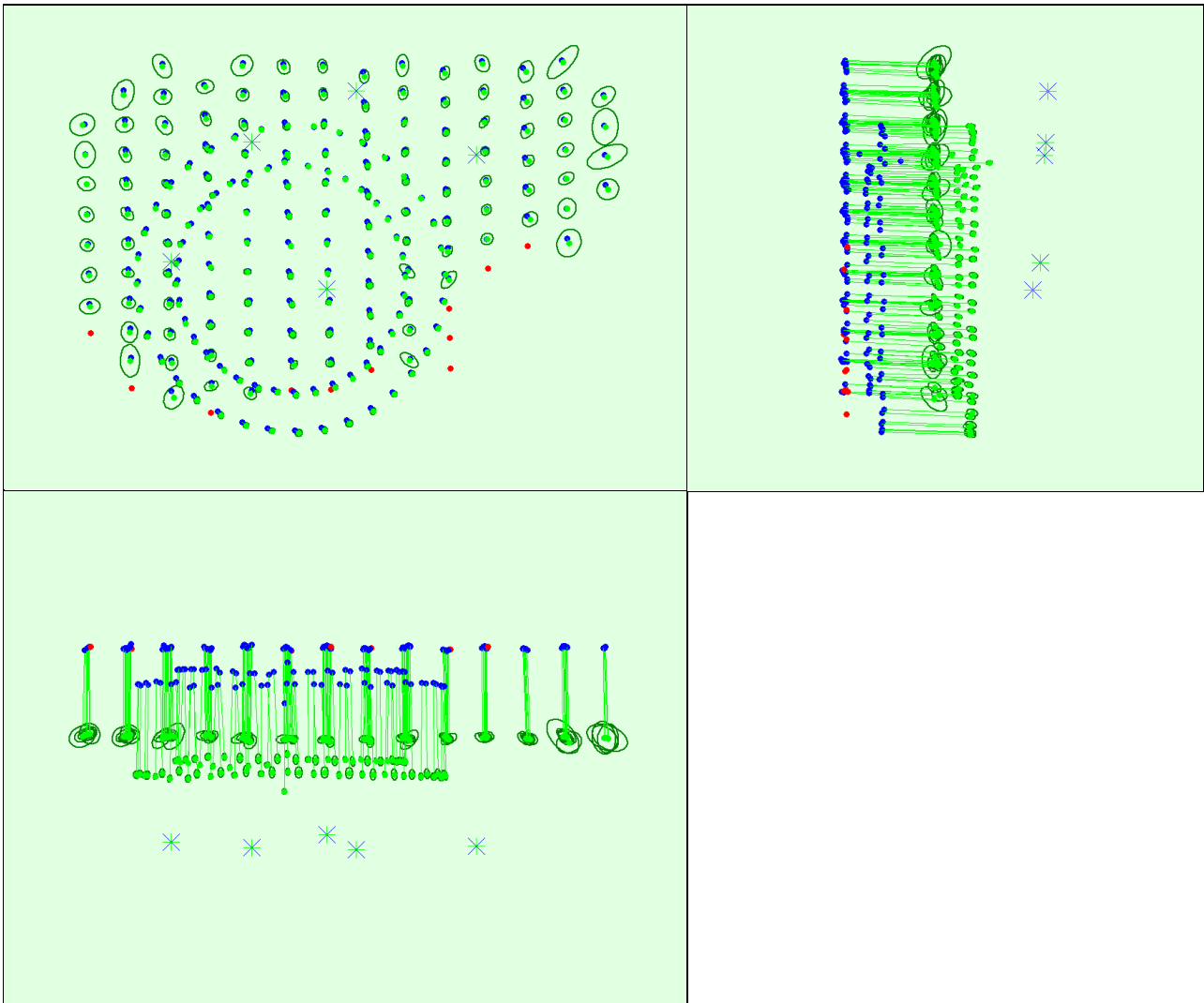


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

## **?** Computed Image/GCPs/Manual Tie Points Positions





Uncertainty ellipses 100x magnified

Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated images. Dark green ellipses indicate the absolute position uncertainty of the bundle block adjustment result.

### 🔍 Absolute camera position and orientation uncertainties



	X [m]	Y [m]	Z [m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.023	0.025	0.022	0.025	0.020	0.016
Sigma	0.014	0.015	0.012	0.011	0.013	0.012

## Bundle Block Adjustment Details



Number of 2D Keypoint Observations for Bundle Block Adjustment	1770558
Number of 3D Points for Bundle Block Adjustment	598660
Mean Reprojection Error [pixels]	0.173

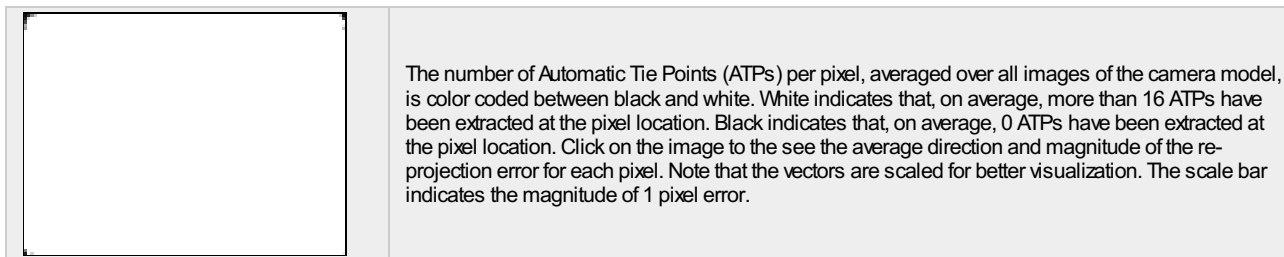
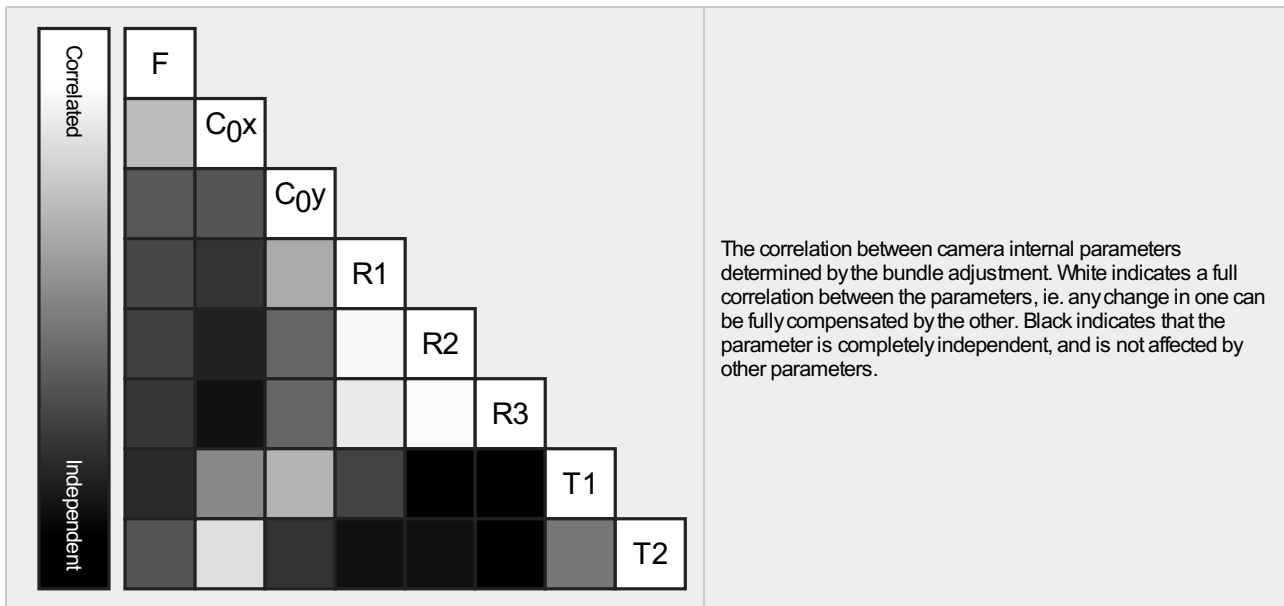
### 🔍 Internal Camera Parameters

📷 albris\_8.0\_7152x5368 (RGB). Sensor Dimensions: 10.013 [mm] x 7.515 [mm]



EXIF ID: albris\_8.0\_7152x5368

	Focal Length	Principal Point x	Principal Point y	R1	R2	R3	T1	T2
Initial Values	5672.979 [pixel] 7.942 [mm]	3576.000 [pixel] 5.006 [mm]	2684.000 [pixel] 3.758 [mm]	0.242	-0.643	0.506	0.000	0.001
Optimized Values	5665.590 [pixel] 7.932 [mm]	3622.875 [pixel] 5.072 [mm]	2722.233 [pixel] 3.811 [mm]	0.243	-0.657	0.521	-0.000	0.000
Uncertainties (Sigma)	0.544 [pixel] 0.001 [mm]	0.501 [pixel] 0.001 [mm]	0.470 [pixel] 0.001 [mm]	0.001	0.002	0.003	0.000	0.000



## 2D Keypoints Table

	Number of 2D Keypoints per Image	Number of Matched 2D Keypoints per Image
Median	35000	8333
Min	33932	197
Max	35000	19059
Mean	34963	8853

## 3D Points from 2D Keypoint Matches

	Number of 3D Points Observed
In 2 Images	376487
In 3 Images	103830
In 4 Images	44736
In 5 Images	24495
In 6 Images	15372
In 7 Images	10165
In 8 Images	7231
In 9 Images	5287
In 10 Images	3711
In 11 Images	2371
In 12 Images	1544
In 13 Images	972
In 14 Images	657
In 15 Images	455

In 16 Images	345
In 17 Images	237
In 18 Images	203
In 19 Images	128
In 20 Images	115
In 21 Images	85
In 22 Images	64
In 23 Images	53
In 24 Images	30
In 25 Images	21
In 26 Images	17
In 27 Images	12
In 28 Images	9
In 29 Images	9
In 30 Images	4
In 31 Images	3
In 32 Images	6
In 33 Images	4
In 35 Images	1
In 36 Images	1

**2D Keypoint Matches**

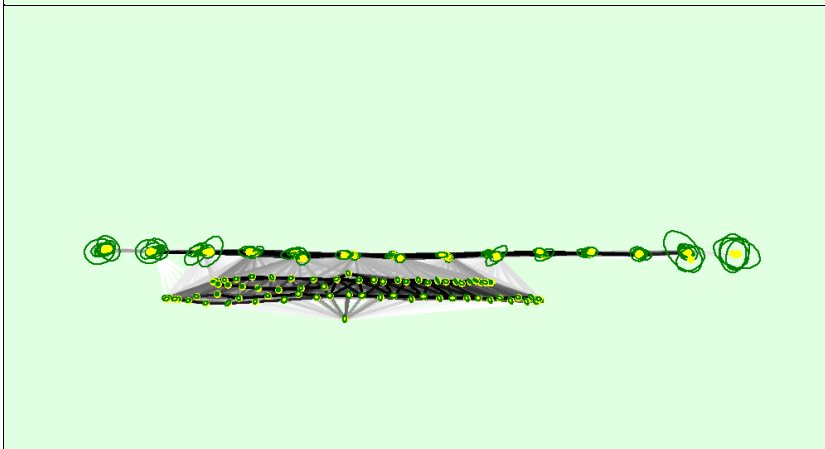
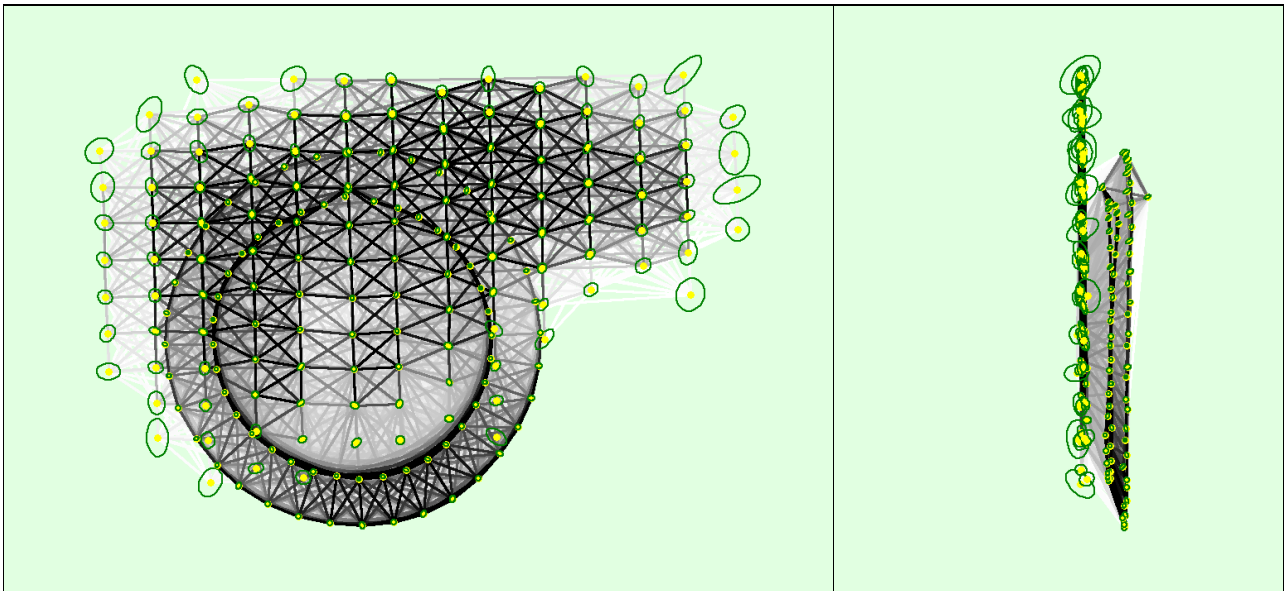


Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the images. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

## Relative camera position and orientation uncertainties



	X[m]	Y[m]	Z[m]	Omega [degree]	Phi [degree]	Kappa [degree]
Mean	0.019	0.021	0.015	0.021	0.019	0.014
Sigma	0.014	0.015	0.013	0.012	0.013	0.012

## Geolocation Details



### Ground Control Points



GCP Name	Accuracy XY/Z [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
PP1 (3D)	0.020/ 0.020	-0.011	-0.004	-0.005	0.356	4 / 4
PP3 (3D)	0.020/ 0.020	0.008	-0.003	0.007	0.887	4 / 4
PP4 (3D)	0.020/ 0.020	0.009	0.009	-0.013	0.448	4 / 4
PP5 (3D)	0.020/ 0.020	-0.008	0.000	0.009	1.584	6 / 6
PP6 (3D)	0.020/ 0.020	0.000	-0.000	-0.007	0.773	5 / 5
<b>Mean [m]</b>		-0.000400	0.000355	-0.001644		
<b>Sigma [m]</b>		0.007885	0.004586	0.008449		
<b>RMS Error [m]</b>		0.007895	0.004600	0.008607		

0 out of 2 check points have been labeled as inaccurate.

Check Point Name	Accuracy XY/Z [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
PP2	0.0200/0.0200	0.0044	0.0011	-0.0645	0.5327	3 / 3
FMBOLT	0.0200/0.0200	0.0096	0.0061	0.0652	0.8553	3 / 3
<b>Mean [m]</b>		0.007000	0.003577	0.000341		
<b>Sigma [m]</b>		0.002623	0.002506	0.064825		
<b>RMS Error [m]</b>		0.007475	0.004368	0.064826		

Localisation accuracy per GCP and mean errors in the three coordinate directions. The last column counts the number of calibrated images where the GCP has been automatically verified vs. manually marked.

### Absolute Geolocation Variance



Min Error [m]	Max Error [m]	Geolocation Error X [%]	Geolocation Error Y [%]	Geolocation Error Z [%]
-	-2.85	0.00	0.00	0.00
-2.85	-2.28	0.00	0.00	2.50
-2.28	-1.71	3.00	1.50	4.50
-1.71	-1.14	6.00	4.00	9.50
-1.14	-0.57	15.50	11.50	14.00
-0.57	0.00	20.50	31.50	23.50
0.00	0.57	29.50	23.50	17.00
0.57	1.14	21.00	23.00	12.50
1.14	1.71	3.00	4.50	6.50
1.71	2.28	1.50	0.50	6.00
2.28	2.85	0.00	0.00	2.50
2.85	-	0.00	0.00	1.50
<b>Mean [m]</b>		-0.314720	1.371729	44.672755
<b>Sigma [m]</b>		0.796417	0.716013	1.210639
<b>RMS Error [m]</b>		0.856347	1.547358	44.689156

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns X, Y, Z show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

Geolocation Bias	X	Y	Z
Translation [m]	-0.303073	1.330176	44.666413

Bias between image initial and computed geolocation given in output coordinate system.

## Relative Geolocation Variance

Relative Geolocation Error	Images X[%]	Images Y[%]	Images Z[%]
[-1.00, 1.00]	71.00	73.50	78.00
[-2.00, 2.00]	94.50	98.00	96.50
[-3.00, 3.00]	100.00	100.00	100.00
<b>Mean of Geolocation Accuracy [m]</b>	0.809413	0.809413	1.559946
<b>Sigma of Geolocation Accuracy [m]</b>	0.046958	0.046958	0.181895

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z.

Geolocation Orientational Variance	RMS [degree]
Omega	2.986
Phi	3.889
Kappa	3.579

Geolocation RMS error of the orientation angles given by the difference between the initial and computed image orientation angles.

## Initial Processing Details

### System Information

Hardware	CPU: Intel(R) Core(TM) i7-4710MQ CPU @ 2.50GHz RAM: 32GB GPU: Intel(R) HD Graphics 4600 (Driver: 10.18.14.4414), NVIDIA Quadro K1100M (Driver: 10.18.13.5435), RDPDD Chained DD (Driver: unknown), RDP Encoder Mirror Driver (Driver: unknown), RDP Reflector Display Driver (Driver: unknown)
Operating System	Windows 7 Professional, 64-bit

### Coordinate Systems

Image Coordinate System	WGS84
Ground Control Point (GCP) Coordinate System	WGS84 / UTMzone 32N
Output Coordinate System	WGS84 / UTMzone 32N

### Processing Options

Detected Template	No Template Available
Keypoints Image Scale	Custom, Image Scale: 1
Advanced: Matching Image Pairs	Free Flight or Terrestrial
Advanced: Matching Strategy	Use Geometrically Verified Matching: no
Advanced: Keypoint Extraction	Targeted Number of Keypoints: Custom, Number of Keypoints: 35000
Advanced: Calibration	Calibration Method: Standard Internal Parameters Optimization: All External Parameters Optimization: All Lever-Arm Parameters Optimization: None Rematch: Auto, yes Bundle Adjustment: Classic

## Point Cloud Densification details

## Processing Options



Image Scale	multiscale, 1/2 (Half image size, Default)
Point Density	Optimal
Minimum Number of Matches	3
3D Textured Mesh Generation	no
Advanced: Matching Window Size	9x9 pixels
Advanced: Image Groups	group1
Advanced: Use Processing Area	yes
Advanced: Use Annotations	yes
Advanced: Limit Camera Depth Automatically	yes
Time for Point Cloud Densification	01h:35m:14s

## Results



Number of Generated Tiles	1
Number of 3D Densified Points	25127947
Average Density (per m <sup>3</sup> )	3674.17

## DSM, Orthomosaic and Index Details



### Processing Options



DSM and Orthomosaic Resolution	1 x GSD (0.963 [cm/pixel])
DSM Filters	Noise Filtering: yes Surface Smoothing: yes, Type: Sharp
Raster DSM	Generated: yes Method: Inverse Distance Weighting Merge Tiles: yes
Orthomosaic	Generated: yes Merge Tiles: yes GeoTIFF Without Transparency: no Google Maps Tiles and KML: no
Time for DSM Generation	27m:31s
Time for Orthomosaic Generation	01h:43m:40s